ME08 Activity 6 - Networking

```
Windows PowerShell
                                                                                                                                               "Network": ""
                                                                                                                                          },
"ConfigOnly": false,
". '
les > Documents > UP > 2021-2 > CoE 197 > ME8_Containerization_and_Docker > 6-networking > 🕪 README.md > 🔤 # Exercise 6: Networking > 📟 ### The default `bridge` network
                   "104633917dbfe00843722336838f163b800dde46e632e47470b204c21fc44f21": {
                                                                                                                                          "Containers": {
                                                                                                                                               "97bbd9e345f66ed076707b1b725b13944944e59540d4b0f2f278664540bf15df": {
                      "EndpointID": "38f01d182b8d55de5f8ed3221f12086dd2eac3426b159cc8e6bda0075dbd0f47",
                                                                                                                                                   "Name": "dummy",
"EndpointID": "53be18443e8a17c02ed3e2ec084cbf74674069df9fa8a62d5e1ee1c
                       "MacAddress": "02:42:ac:11:00:02",
                      "IPv4Address": "172.17.0.2/16",
                                                                                                                                  200fdb9ee",
                       "IPv6Address": ""
                                                                                                                                                   "MacAddress": "02:42:ac:11:00:02",
                                                                                                                                                   "IPv4Address": "172.17.0.2/16", "IPv6Address": ""
                                                                                                                                          },
"Options": {
                                                                                                                                               "com.docker.network.bridge.default_bridge": "true",
       You can see the container was added to the default network. Now let's add another 'ping' container, and set it to ping our
                                                                                                                                               "com.docker.network.bridge.enable_icc": "true",
       first.
                                                                                                                                               com.docker.network.bridge.enable_ip_masquerade": "true"
                                                                                                                                               "com.docker.network.bridge.host_binding_ipv4": "0.0.0.0",
  92 $ docker run --rm -d -e PING TARGET=172.17.0.2 --name pinger delner/ping:1.0
                                                                                                                                               "com.docker.network.bridge.name": "docker0",
       3a79f28b8ac36c0e7aae523c4831c9405c110d593c15a30639606250595b245b
                                                                                                                                               "com.docker.network.driver.mtu": "1500"
       $ docker ps
                                                                                                                                          },
"Labels": {}
       CONTAINER ID
                                                                                        STATUS
                                                                                                          PORTS
       NAMES
                                                                   4 seconds ago
       3a79f28b8ac3
                          delner/ping:1.0
                                             "sh -c 'ping $PING..."
                                                                                        Up 3 seconds
       pinger
                                                                                                                                 PS D:\Files\Documents\UP\2021-2\CoE 197\ME8_Containerization_and_Docker\5-volumes> doc
       104633917dbf
                                             "sh -c 'ping $PING..." About a minute ago Up About a minute
                          delner/ping:1.0
                                                                                                                                  ker run --rm -d -e PING_TARGET=172.17.0.2 --name pinger c4rlo/ping:1.0
                                                                                                                                  5ee46c82a939188360185f4a3c7d347e9a03dde1c174f291dfb801a8266be9f3
       $ docker logs pinger
                                                                                                                                 PS D:\Files\Documents\UP\2021-2\CoE 197\ME8_Containerization_and_Docker\5-volumes> doc
       PING 172.17.0.2 (172.17.0.2) 56(84) bytes of data.
                                                                                                                                 ker ps
       64 bytes from 172.17.0.2: icmp_seq=1 ttl=64 time=0.171 ms
                                                                                                                                 CONTAINER ID IMAGE
                                                                                                                                                                    COMMAND
                                                                                                                                                                                               CREATED
                                                                                                                                                                                                                  STATUS
       64 bytes from 172.17.0.2: icmp_seq=2 ttl=64 time=0.100 ms
                                                                                                                                     PORTS
                                                                                                                                                NAMES
       64 bytes from 172.17.0.2: icmp_seq=3 ttl=64 time=0.098 ms
                                                                                                                                  5ee46c82a939
                                                                                                                                                c4rlo/ping:1.0 "sh -c 'ping $PING_T..." 6 seconds ago
                                                                                                                                                                                                                  Un 4 seconds
       64 bytes from 172.17.0.2: icmp seq=4 ttl=64 time=0.098 ms
                                                                                                                                 97bbd9e345f6 c4rlo/ping:1.0 "sh -c 'ping $PING_T..." 47 seconds ago Up 45 second
                                                                                                                                 PS D:\Files\Documents\UP\2021-2\CoE 197\ME8 Containerization and Docker\5-volumes> doc
       Inspecting the logs for 'pinger' we can see it was able to successfully ping the other container in the network. While IP
       address does work, it's very cumbersome and prone to error if addresses change. It would be better to use a hostname,
       specifically the container name `dummy`, to always resolve to the correct container.
                                                                                                                                 PING 172.17.0.2 (172.17.0.2) 56(84) bytes of data.
                                                                                                                                 64 bytes from 172.17.0.2: icmp_seq=1 ttl=64 time=0.168 ms
       Running ping with the dummy as the target:
                                                                                                                                 64 bytes from 172.17.0.2: icmp seq=2 ttl=64 time=0.053 ms
                                                                                                                                 64 bytes from 172.17.0.2: icmp_seq=3 ttl=64 time=0.068 ms
                                                                                                                                 64 bytes from 172.17.0.2: icmp_seq=4 ttl=64 time=0.068 ms
       $ docker run --rm -d -e PING TARGET=dummy --name pinger delner/ping:1.0
                                                                                                                                 64 bytes from 172.17.0.2: icmp seq=5 ttl=64 time=0.052 ms
       3a79f28b8ac36c0e7aae523c4831c9405c110d593c15a30639606250595b245b
                                                                                                                                 64 bytes from 172.17.0.2: icmp_seq=6 ttl=64 time=0.061 ms
       $ docker ps
                                                                                                                                 64 bytes from 172.17.0.2: icmp_seq=7 ttl=64 time=0.048 ms
       CONTAINER ID
                          IMAGE
                                                                                        STATUS
                                                                                                          PORTS
                                                                                                                                 64 bytes from 172.17.0.2: icmp_seq=8 ttl=64 time=0.055 ms
       NAMES
                                                                                                                                 64 bytes from 172.17.0.2: icmp seq=9 ttl=64 time=0.058 ms
       104633917dbf
                          delner/ping:1.0
                                            "sh -c 'ping $PING..." About a minute ago Up About a minute
                                                                                                                                 64 bytes from 172.17.0.2: icmp_seq=10 ttl=64 time=0.077 ms
       dummy
                                                                                                                                 64 bytes from 172.17.0.2: icmp_seq=11 ttl=64 time=0.058 ms
```

Ping and pinger

```
PS D:\Files\Documents\UP\2021-2\CoE 197\ME8_Containerization_and_Docker\5-volumes> doc
ker logs pinger
PING 172.17.0.2 (172.17.0.2) 56(84) bytes of data.
64 bytes from 172.17.0.2: icmp_seq=1 ttl=64 time=0.168 ms
64 bytes from 172.17.0.2: icmp seq=2 ttl=64 time=0.053 ms
64 bytes from 172.17.0.2: icmp_seq=3 ttl=64 time=0.068 ms
64 bytes from 172.17.0.2: icmp seg=4 ttl=64 time=0.068 ms
64 bytes from 172.17.0.2: icmp_seq=5 ttl=64 time=0.052 ms
64 bytes from 172.17.0.2: icmp seg=6 ttl=64 time=0.061 ms
64 bytes from 172.17.0.2: icmp_seq=7 ttl=64 time=0.048 ms
64 bytes from 172.17.0.2: icmp seq=8 ttl=64 time=0.055 ms
64 bytes from 172.17.0.2: icmp_seq=9 ttl=64 time=0.058 ms
64 bytes from 172.17.0.2: icmp_seq=10 ttl=64 time=0.077 ms
64 bytes from 172.17.0.2: icmp seq=11 ttl=64 time=0.058 ms
64 bytes from 172.17.0.2: icmp_seq=12 ttl=64 time=0.079 ms
64 bytes from 172.17.0.2: icmp seq=13 ttl=64 time=0.053 ms
64 bytes from 172.17.0.2: icmp seq=14 ttl=64 time=0.093 ms
64 bytes from 172.17.0.2: icmp_seq=15 ttl=64 time=0.055 ms
64 bytes from 172.17.0.2: icmp seq=16 ttl=64 time=0.058 ms
64 bytes from 172.17.0.2: icmp_seq=17 ttl=64 time=0.082 ms
64 bytes from 172.17.0.2: icmp seq=18 ttl=64 time=0.063 ms
64 bytes from 172.17.0.2: icmp_seq=19 ttl=64 time=0.090 ms
64 bytes from 172.17.0.2: icmp seq=20 ttl=64 time=0.078 ms
64 bytes from 172.17.0.2: icmp seq=21 ttl=64 time=0.193 ms
```

Skynet ping and pinger

```
PS D:\Files\Documents\UP\2021-2\CoE 19/\ME8 Containerization and Docker\5-volumes> <mark>doc</mark>
ker run --rm -d --name widgetdb --network skynet -e POSTGRES PASSWORD=pass -p 5432 pos
tgres
5baa69f31b290040dbc678ee9da478d89171d12e0c1281d1ec2309a3ff79aa6b
PS D:\Files\Documents\UP\2021-2\CoE 197\ME8 Containerization and Docker\5-volumes> doc
ker run --rm -d --name gadgetdb --network skynet -e POSTGRES_PASSWORD=pass -p 5432 pos
tgres
880b1921e57e749a59f2d9e48cb43f03a9ed4803a9558551ffddce994f618b48
PS D:\Files\Documents\UP\2021-2\CoE 197\ME8_Containerization_and_Docker\5-volumes> doc
ker ps
CONTAINER ID
              IMAGE
                          COMMAND
                                                                    STATUS
                                                                                   POR
                                                   CREATED
                       NAMES
880b1921e57e
              postgres
                          "docker-entrypoint.s..."
                                                   5 seconds ago
                                                                    Up 3 seconds
                                                                                   0.0
.0.0:50879->5432/tcp
                      gadgetdb
              postgres "docker-entrypoint.s..."
                                                   11 seconds ago Up 8 seconds
5baa69f31b29
                                                                                   0.0
.0.0:50878->5432/tcp
                      widgetdb
PS D:\Files\Documents\UP\2021-2\CoE 197\ME8 Containerization and Docker\5-volumes> doc
ker exec -it widgetdb /bin/bash
root@5baa69f31b29:/# psql -U postgres -h gadgetdb
Password for user postgres:
psql: error: FATAL: password authentication failed for user "postgres"
root@5baa69f31b29:/# psql -U postgres -h gadgetdb
Password for user postgres:
psql (13.3 (Debian 13.3-1.pgdg100+1))
Type "help" for help.
postgres=# \a
root@5baa69f31b29:/# exit
exit
```

Connecting between containers in a network

```
root@ddbaba011457:/# exit
exit
PS D:\Files\Documents\UP\2021-2\CoE 197\ME8 Containerization and Docker\5-volumes> <mark>doc</mark>
ker run --rm -d --name widgetdb --network skynet -e POSTGRES PASSWORD=pass -p 5432:543
2 postgres
docker: Error response from daemon: Conflict. The container name "/widgetdb" is alread
y in use by container "ddbaba01145769d09af684b0a991d7232676070e710048cff162cffa5e42426
f". You have to remove (or rename) that container to be able to reuse that name.
See 'docker run --help'.
PS D:\Files\Documents\UP\2021-2\CoE 197\ME8 Containerization and Docker\5-volumes> doc
ker stop widgetdb
widgetdb
PS D:\Files\Documents\UP\2021-2\CoE 197\ME8 Containerization and Docker\5-volumes> <mark>doc</mark>
ker run --rm -d --name widgetdb --network skynet -e POSTGRES PASSWORD=pass -p 5432:543
2 postgres
983f4c949a9b9e14e7a8c1e2926e055936ea2fe05a6a9c68a3a2266522204fe9
PS D:\Files\Documents\UP\2021-2\CoE 197\ME8 Containerization and Docker\5-volumes> doc
ker exec -it
"docker exec" requires at least 2 arguments.
See 'docker exec --help'.
Usage: docker exec [OPTIONS] CONTAINER COMMAND [ARG...]
Run a command in a running container
PS D:\Files\Documents\UP\2021-2\CoE 197\ME8 Containerization and Docker\5-volumes> <mark>doc</mark>
ker exec -it widgetdb /bin/bash
root@983f4c949a9b:/# psql -U postgres -h localhost
psql (13.3 (Debian 13.3-1.pgdg100+1))
Type "help" for help.
postgres=# \q
root@983f4c949a9b:/# exit
exit
```

Binding port to host